EPIDEMIOLOGY

Sexual and treatment-seeking behaviour for sexually transmitted infection in long-distance transport workers of East Africa

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Objective: To investigate the sexual and treatment-seeking behaviour for sexually transmitted infection (STI) in long-distance transport workers of East Africa.
Methods: A health-seeking behaviour survey was carried out at four sites on the Mombasa–Kampala trans-Africa highway (n = 381). The questionnaires probed details of STI knowledge, symptoms and care-seeking behaviour. In one site at the Kenya–Uganda border, a sexual patterning matrix was used (n = 202) to measure sexual behaviour in truck drivers and their assistants over the 12-month period before the interview.
Results: Over half of the sexual acts of long-distance transport workers over 12 months were with female sex workers, with an annual average of 2.8 sexual partners. Condom use was reported at 70% for liaisons with casual partners. 15% of truckers had had a self-reported STI and one-third exhibited high-risk sexual behaviour in the previous year. Of those with an STI, 85% had symptoms when on the road and 77.2% sought treatment within 1 week of onset of symptoms. 94% of drivers and 56% of assistants sought treatment for STI in a private health facility or pharmacy. The cost of private facilities and pharmacies was not significantly higher than in the public sector. Waiting times were three times longer in the public sector. Only 28.9% of patients completed their medication courses as prescribed.
Conclusions: Truck drivers and their assistants in East Africa have high rates of reported STIs and many continue to exhibit high-risk sexual behaviour. The transport workers studied here favoured private health facilities because of convenience and shorter waiting times.

It has been documented that truck drivers and their assistants in East Africa and Kenya are at higher risk of HIV than the general population. A survey of 970 drivers and assistants at a roadside clinic at Athi River showed a 27% prevalence of HIV, and a study of 283 drivers and assistants at Mariakani in 1995 showed a similar prevalence of 26%.[1 2]

A recently completed study of geographical areas of increased transactional sex on the major transport corridor between the port of Mombasa, Kenya, and Kampala, Uganda, showed that there were approximately 8000 sex workers on this highway and that, annually, 3000–4000 new HIV infections were projected to occur on this transport corridor among sex workers and their clients.[3 4]

As part of the study, the sexual and treatment-seeking behaviour for sexually transmitted infection (STI) in a sample of transport workers on the trans-Africa highway of East Africa was assessed and forms the basis of the present paper.

METHODS

The study was carried out at four locations in Kenya (Mlolongo, Makindu, Navaisha and Malaba), all of which are major truck stops on the trans-Africa highway.[4 5] A convenience sample of 381 transport workers was drawn, and interviews were carried out with 162 truck drivers and 219 truck driver assistants. Participants were recruited while waiting at truck stops. In general, one truck has one driver and one assistant for a trip. A total of 60 interviews were conducted in Mlolongo, 59 in Makindu, 60 in Naivaisha and 202 in Malaba. The over-sampling at Malaba was caused by the normal delays in trucks crossing the Kenya–Uganda border.

The questionnaire in Malaba included a sexual patterning matrix used previously by the authors.[6] We elicited information on sexual partners in the 12 months before the interview, frequency of liaisons, condom use and type of partner.

Respondents were recruited at each site by five trained research assistants. Informed consent was obtained and one-on-one interviews were conducted in Kiswahili, using a detailed questionnaire, developed from focus group discussions with truckers covering topics such as demographic information, knowledge on STI symptoms, experience of STI symptoms, STI health-seeking behaviour and perceptions of healthcare facilities.[4 5] Two truckers refused to answer the questions regarding sexual patterns, but all other data were complete.

No financial or other compensation was given to respondents.

Data were entered into the SPSS V.13.

RESULTS

Sociodemographics

Table 1 shows the basic demographic information on our sample. The majority of truckers interviewed were from Kenya (83.2%), Uganda (9.4%) and the Democratic Republic of Congo (2.4%; not shown).

Table 2 shows the average number of nights spent at home during the year before the interview. Few truckers spent significant periods of time at home, with 51.3% spending <40 nights per year at home.

Sexual patterning

Figure 1 shows the distribution of numbers of different sexual partners reported by the truckers over the 12 months preceding the interview. Overall, the men averaged 2.8 sexual partners (median 2, mode 1, range 0–11).

Abbreviation: STI, sexually transmitted infection

Table 1 Demographic data on truck drivers and their assistants

	Occupation Drivers (n = 162)	Assistants (n = 219)
Age (years, n = 381)		
⩽25	9 (5.6)	66 (30.2)
26–30	26 (16.1)	91 (41.7)
31–35	38 (23.6)	40 (18.4)
⩾36	88 (54.7)	21 (9.7)
No response	1	1
Education (n = 381)		
None	8 (4.9)	4 (1.8)
Primary	84 (51.8)	94 (42.9)
Secondary	62 (38.3)	107 (48.6)
Post-secondary	8 (4.9)	14 (6.4)
Marital status		
Never married	7 (4.3)	65 (29.7)
Married/cohabiting	149 (92)	152 (69.4)
Separated/divorced/widowed	6 (3.7)	2 (0.9)
Religion		
Protestant	54 (33.3)	94 (43)
Catholic	60 (37)	68 (31)
Muslim	44 (27.2)	50 (22.8)
None, other or no response	4 (2.5)	7 (3.2)

Values are n (%).

The reported numbers of partners peaked in the 25–29-year age group (n = 65, mean 3.14 partners).

Among currently married men, 47.5% of drivers were monogamous, compared with 32.5% of assistants. Comparing the mean numbers of extramarital partners with currently married respondents, the mean for drivers was 1.26, and for assistants, 2.10 ($t = 2.4$, $p = 0.02$).

For the whole sample, over half of the sexual encounters recorded over the 12-month period were with female sex workers. Of the 555 partners cited, the most common type of relationship was a casual relationship with a female sex worker.

Figure 2 shows four measures of condom use with different types of sexual partner reported by the truckers. Ever-use of condoms >60% for all types of partner other than wives, for whom the proportion was 20%. All measures of condom use increased with the degree of social distance between the respondent and the type of partner. For casual relationships with sex workers, the use of condoms was at a maximum, and all four measures converged at 86–88%. For all non-spousal relationships, the overall rate of condom use was 74% for ever-use and 71% for use at the last liaison.

Triangulation from the current trip report data shows that condoms were used in 79% of liaisons between truckers and non-spousal, non-regular partners, a result similar to that obtained from the 1-year recall.

Aggregating sexual behaviour into a risk-avoidance format using abstinence, faithfulness and condom use as a framework gives the pattern shown in fig 3. On the basis of self-reported behaviour, a small proportion of truckers abstained completely from sex, under one-third reported a monogamous relationship, and the remaining two-thirds had multiple partners. Overall, about one-third of truckers exhibited risky sexual behaviour with inconsistent condom use with multiple partners.

Table 3 shows the mean number of reported partners for men reporting and not reporting an STI symptom over the 12 months before the interview, classified by any symptom, symptoms of discharge and symptoms of genital sores. A strong association for all measures between multiple partners and recent experience of STI exists.

Table 2 Nights that truck drivers and their assistants spent at home in previous 12 months (n = 376)

Nights spent at home	n (%)
<5	23 (6.1)
6–9	23 (6.1)
10–19	47 (12.5)
20–29	79 (21.0)
30–39	60 (16.0)
⩾40	144 (38.3)

Prevalence of STI and health-seeking behaviour for STIs

In the sample of 381 men, 58 (15.2%) reported experiencing a genital sore, urethral discharge or both symptoms in the past 12 months. In all, 35 individuals reported experiencing a genital sore and 47 reported urethral discharge, giving reported prevalence rates of 9.2% and 12.3%, respectively. Of the men reporting an STI in the past year, 21 were truck drivers and 37 were truck drivers' assistants. Independent t tests showed a significant difference in the mean ages of those reporting and not reporting STI symptoms The former were, on average, 2.7 years younger than the latter ($t = 2.5$, $p<0.05$).

In all, 84.7% of those who had experienced STI symptoms first realised that they had an STI when they were on the road, and 75.9% sought treatment within 1 week of the onset of the symptoms, with 41.4% seeking treatment in 1–3 days. A total of 87% of the men who had experienced urethral discharge and 70.6% of those with genital sores sought care in ⩽1 week. Omitting the men who had experienced both urethral discharge and genital sores, there was no significant difference in the length of time before seeking treatment between the men with either symptom.

When first seeking STI care, 88% of truckers sought care in private health facilities, public health facilities and pharmacies. Of those seeking care in the formal sector as defined above, the largest proportion attended private health facilities (45.1%), whereas 31.4% attended public health facilities and the remaining 23.5% sought treatment at a pharmacy. The health-seeking behaviour of drivers and assistants was significantly different, with the drivers tending to use private facilities and the assistants preferring public facilities. In all, 94% of drivers and 56% of assistants sought treatment for STI in a private health facility or pharmacy. The most common reason

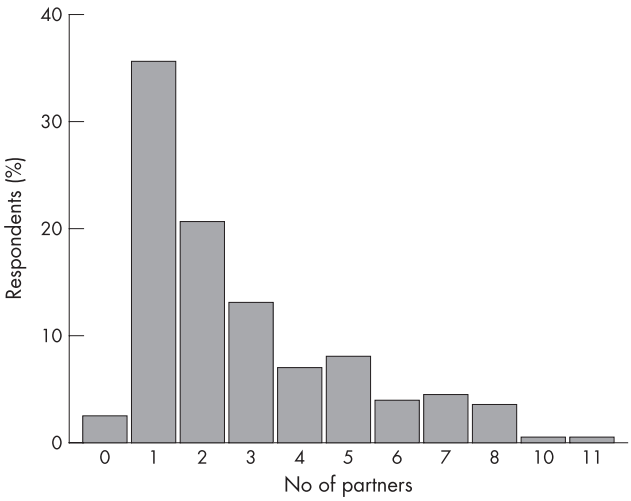

Figure 1 Reported numbers of sexual partners over 12-month period.

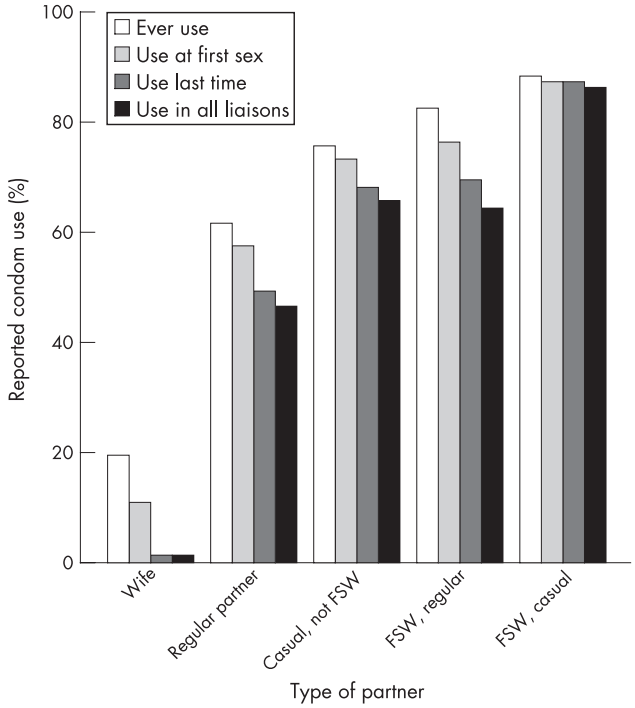

Figure 2 Condom use over 12-month period by type of sexual partner. FSW, female sex worker.

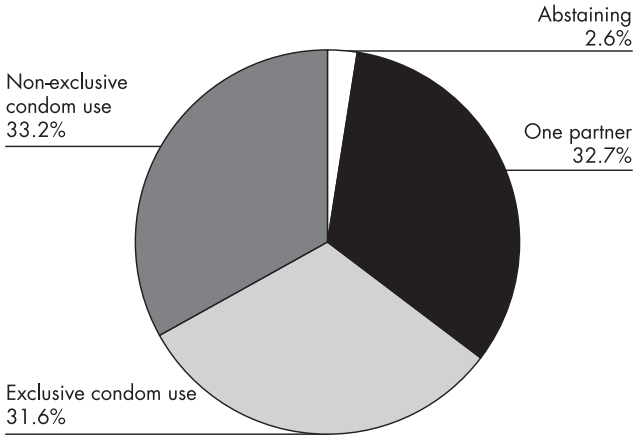

Figure 3 Sexual risk behaviours of transport workers.

for choice of facility was cost for drivers' assistants and convenience for drivers.

Of those who sought care for their symptoms, 73.6% were given medications from the facility that they attended. Public hospitals and clinics gave medication 87.5% of the time, private hospitals and clinics provided medication for 77.3% of cases, and pharmacies gave medication 50.0% of the time. There was considerable variability in how the men took the medication that they were prescribed, but it did not differ with the different facilities attended. Less than one-third (28.9%) took the medication until completion, and the remaining 70% took the medication until they felt better, until symptoms had disappeared or for various amounts of time.

Overall, for the 54 individuals who responded to the question about cost, the mean and median cost of treatment for STI was Ksh 934.44 (US$ 13.44, £6.92, €10.10) and Ksh 600 (US$ 8.63, £4.44, €6.48), respectively. Charge for treatment ranged from zero to a maximum of Ksh 4800 (US$69.04, £35.56, €51.86). Contrary to the truckers' perceptions, the public facilities had a higher mean cost of Ksh 1160 (US$16.69, £8.59, €12.53) as compared with Ksh 817 (US$11.75, £6.05, €8.42) for private facilities and Ksh 763 (US$10.97, £5.65, €8.24) for pharmacies providing medications.

Stated waiting time varied considerably between the 55 respondents to this question, ranging from no wait at all to a maximum of 24 h, a median of 30 min. Of those who had sought treatment for STI symptoms, 81.8% waited for <1 h. The mean waiting time for treatment at public health facilities of 109 min was over three times longer than at private facilities and more than twice as long as at pharmacies.

DISCUSSION

In order for STI and HIV control to be effective, it is important that high-risk groups seek and receive high-quality treatment for their STI symptoms.[7] As transport workers have been shown to be at higher risk for STI and HIV along the trans-Africa highway, it is imperative to know more about their sexual and health-seeking behaviour. This will help inform both current and future interventions.

Limitations of this study included the use of self-report of STIs as opposed to more objective means of determining outcomes. Tendency to under-report may underestimate the true levels, either through social desirability or through recall biases.[8] Examination of the time trend in the sexual patterning matrices indicated that the recall bias is estimated at 10% of the number of partners reported.

The self-reported prevalence of STI in this cohort is significantly higher than that of the self-reported prevalence of urethral discharge and genital sores in men in the general population in Kenya. We found an overall reported prevalence of 15%, which is more than seven times that of the general population.[9]

The analysis of sexual patterning can explain these high rates. Although 32% of truckers reported a monogamous relationship over the 12 months before the interview, one-third reported behaviour that is conducive to the transmission of STI and HIV. The mean number of sexual partners is significantly higher among those reporting any STI. Although reported condom use is high, especially with casual partners, it is not sufficiently consistent to prevent the high levels of STI transmission observed. In addition, more than half of sexual acts of the truck drivers and assistants were with sex workers, who are at high risk of HIV and STIs. The mean number of partners and extramarital partners does not differ significantly with respect to time away from home. The pattern of reported sexual behaviour is consistent with evidence from the sexual networking of highway-based sex workers, in terms of types of partner and levels of condom use.[10]

We found that truck drivers and their assistants had differences between them in terms of facility attended for treatment for STI, with drivers seeking care more frequently in private facilities. This preference for private facilities has been

Table 3 Mean number of sexual partners reporting symptoms of sexually transmitted infections

Symptom	Reported	Not reported	t Value, p value
Any symptom (n = 37)	4.5	2.4	4.8, <0.001
Urethral discharge (n = 30)	4.7	2.5	5.4, <0.001
Genital sore (n = 24)	4.1	2.7	3.0, 0.003

described in other studies in Kenya.[5 11] Drivers' assistants were also more likely to attend a public facility than were truck drivers. As drivers' assistants make less money than the drivers, it is not surprising that they were more likely than drivers to list cost as a reason for preferring a given facility, and also were much more likely to attend the perceived less expensive facility, although the final cost at the public facility may actually be higher than the private equivalent. Private facilities are much more available and accessible than public facilities in the truck stops along the trans-Africa highway; thus they are the most convenient option for truckers.[4 5]

Over 88% of men who had experienced an STI sought treatment, the vast majority of these within 1 week. This is important because a short symptom duration and delay seeking treatment lessens the chances of STI transmission. Also, only a minority of the men continued to have sex while they had symptoms, and of these, over three-quarters used condoms to protect their partner. Although the vast majority of men sought treatment in some form, and most within the formal health sector, there were differences in where they sought care. The choice of provider has been shown to influence treatment outcomes in the control of STIs, as treatment quality varies considerably between public facilities, private facilities and pharmacies. In one study in Kenya, public facilities were shown to provide the best quality of treatment whereas private facilities and pharmacies provided the poorest.[12] As private facilities overall were the most commonly used facility for STI treatment, the quality of these is of primary importance and requires further study.

Waiting time was the only aspect of treatment that differed significantly between any of the facilities, with longer waits experienced at government facilities than at private facilities. The increased wait is probably because of the increased volume of patients, limited manpower and decreased number of facilities in comparison with private facilities.

The reported cost of the medication provided for STI did not differ between government facilities, private facilities or pharmacies, even though government facilities have a policy of supplying free drugs for STI. There is a lack of access to free medications for STI in the health facilities in the public sector as the costs of these medications are borne by the patients. The reasons for the continued use of the high-cost public facilities by drivers' assistants needs more study but could be related to non-transparency of costing at public facilities and the wide variation in costs at these facilities.

All three types of facility—public, private and pharmacies—provided prescriptions for STI. Pharmacies in Kenya are not legally allowed to provide prescriptions, or medications without a prescription. Clearly, these restrictions are only being partially observed by the pharmacies. It is apparent that pharmacies are treating STIs; thus, it is crucial that staff in pharmacies have received proper training and are properly regulated for the treatment of STI as this has been shown to enhance the quality of care for patients with STI.[13–16]

Prevalence of self-reported STIs among the truck drivers in this study is higher than that of the general population, and truckers are still engaging in high-risk behaviour. Targeted interventions are needed to decrease the rate of infection in these men.[17] Furthermore, as truck drivers and their assistants utilise a variety of healthcare facilities, it is imperative that any intervention targets public facilities, private health facilities and pharmacies. On the basis of the results of this study, it may be beneficial to work towards changing legislation to allow pharmacies to treat STIs and to implement training strategies for staff of pharmacies. Alternatively, the services provided in the public sector could be made more attractive to this high-risk group by maintaining longer working hours and decreasing waiting times.[18]

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CNM designed the study, helped prepare the study instruments, supervised data collection, contributed to data analysis and authored the manuscript. AGF helped prepare the study instruments, supervised data collection, contributed to data analysis and edited the manuscript.

REFERENCES

1 **Bwayo J**, Plummer F, Omari M, *et al*. Human immunodeficiency virus infection in long-distance truck drivers in east Africa. *Arch Intern Med* 1994;**154**:1391–6.
2 **Mbugua GG**, Muthami CW, Mutua SA, *et al*. Epidemiology of HIV infection among long distance truck drivers in Kenya. *East Afr Med J* 1995;**8**:515–18.
3 **Morris CN**, Ferguson AG. Estimation of the sexual transmission of HIV in Kenya and Uganda on the trans-Africa highway: the continuing role for prevention in high risk groups. *Sex Transm Infect* 2006;**82**:368–71.
4 **Ferguson AG**, Morris CN. Mapping transactional sex on the Northern Corridor highway in Kenya. *Health Place* 2007;**2**:504–19.
5 **Morris CN**, Ferguson AG. *Hot spot mapping on the Northern Corridor transport route: Mombasa to Kampala*. Kenya: Ministry of Transport, Government of Kenya, 2006.
6 **Ferguson AG**, Pere M, Morris CN, *et al*. Sexual patterning and condom use among a group of HIV vulnerable men in Thika. *Kenya Sex Transm Infect*, 2004;80, 435–9.
7 **Moses S**, Ngugi EN, Costigan A, *et al*. Response of a sexually transmitted infection epidemic to a treatment and prevention programme in Nairobi, Kenya. *Sex Transm Infect* 2002;**78**(Suppl 1):i114–20.
8 **Roseberry WL**, Heymann DL, Ndoye I, *et al*. Rapid sexually transmitted disease assessment in two developing countries. *Sex Transm Dis* 1994;**21**(Suppl):S84–5.
9 **Marum L**, Muttunga JN, Munene FM, *et al*. *Kenya Demographic Health Survey*. Kenya: Government of Kenya, 2003.
10 **Ferguson AG**, Morris CN, Kariuki CW. Using diaries to measure parameters of transactional sex: an example from the Trans-Africa highway in Kenya. *Cult Health Sex* 2006;**8**:175–85.
11 **Voeten HA**, O'Hara HB, Kusimba J, *et al*. Gender differences in health seeking behavior for sexually transmitted diseases: a population based study in Nairobi, Kenya. *Sex Transm Dis* 2004;**31**:265–72.
12 **Voetten HA**, Otido JM, O'Hara HB, *et al*. Quality of sexually transmitted disease case management in Nairobi, Kenya: a comparison among different types of healthcare facilities. *Sex Transm Dis* 2001;**28**:633–42.
13 **Turner AN**, Ellertson C, Thomas S, *et al*. Diagnosis and treatment of presumed STIs at Mexican pharmacies: survey results from a random sample of Mexico City pharmacy attendants. *Sex Transm Infect* 2003;**79**:224–8.
14 **Ward K**, Butler N, Mugabo P, *et al*. Provision of syndromic treatment of sexually transmitted infections by community pharmacists: a potentially underutilized HIV prevention strategy. *Sex Transm Dis* 2003;**30**:609–13.
15 **Garcia PJ**, Carcamo CP, Chiappe M, *et al*. Sexually transmitted and reproductive tract infections in symptomatic clients of pharmacies in Lima, Peru. *Sex Transm Infect* Published Online First:17 August 2006. doi: 10, 1136/sti.2006.022657..
16 **Vuylsteke B**, Traore M, Mah-Bi G, *et al*. Quality of sexually transmitted infections services for female sex workers in Abidjan, Cote d'Ivoire Trop. *Med Int Health* 2004;**9**:638–43.
17 **Jackson D**, Rakwar J, Richardson B, *et al*. Decreased incidence of sexually transmitted diseases among trucking company workers in Kenya: results of a behavioral risk reduction programme. *AIDS* 1997;**11**:903–9.
18 **Adu-Sarkodie Y**, Steiner MJ, Attafuah J, *et al*. Syndromic management of urethral discharge in Ghanaian pharmacies. *Sex Transm Infect* 2000;**76**:439–42.